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THE I.C.I. MAGAZINE

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The *I.C.I. Magazine* is published for the interest of all who work in I.C.I., and its contents are contributed largely by people in I.C.I. It is edited by Sir Richard Keane, Bt., and printed at The Kynoch Press, Birmingham, and is published every month by Imperial Chemical Industries Limited, Imperial Chemical House, Millbank, London, S.W.1. Phone: VICtoria 4444. The editor is glad to consider articles for publication, and payment will be made for those accepted.

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FRONT COVER: *Christmas in Regent Street, by T. Keeley*

OUR CONTRIBUTORS

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The Quiet Revolution

By James Thurlby

Sir Alexander Fleck, Chairman of I.C.I., has spoken of the Second Industrial Revolution which Britain is now entering. Quietly, without fuss, with much patience and with immense ingenuity, this revolution took a new stride forward at Nobel Division recently when a tremendous technical problem was brilliantly mastered. This was the introduction of full mechanisation to the manufacture and filling of a very small article to be sold by the million—an I.C.I. plain detonator.

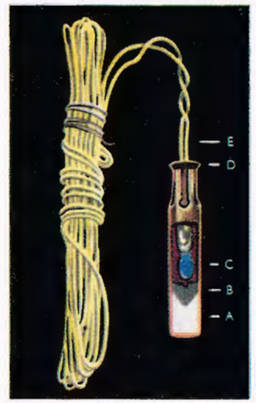
QUIETLY, steadily, the men of Nobel Division have nursed it to maturity—this strangely intelligent machine which sorts and tests, fills and presses, cleans and boxes detonators. Could the detonators but speak they might indeed have a tale to tell. "Untouched by human hand," they might murmur one to the other, with metallic pride and jocularity, as they fall, obligingly in their hundreds, into the cartons in which they are to reach the world's mines and quarries.

And one might be forgiven for hoping that the plant itself, impersonally flicking every few seconds its hundreds of electronic messages that control the rapid manipulation of initiating explosives, would permit itself a split-second sigh of satisfaction. But perhaps such expressions are reserved for the members of Research and Manufacturing Departments.

A quiet revolution has taken place in the quieter corridors of this sand-mounded Ardeer plant where you stride about like Gullivers in rubber boots and hardly realise, until you are told, that the man with the rubber-wheeled trolley is pushing in front of him half a stone of pentaerythritol tetranitrate—one of the most powerful of explosives.

Detonators have been made by Nobel Division for over eighty years. During this time there have been constant efforts to lessen the hazards which manufacture involves for the operatives, principally by reducing to a minimum the handling of the explosive. The "old" system, still in use, which has produced an almost incalculable number of detonators without major mishap, necessitates handling at several points, although all such operations as filling and pressing—from which the main hazards derive—are carried out by remote control from behind protective walls.

No visitor to the "old" detonator plant can have come away without marvelling at the digital dexterity of the girls who fill the detonator cartons by hand. Shuffling a thousand or so of these explosive cylinders with the aplomb of a Mississippi cardsharper, a girl will take a handful and box them in a carton made to hold a hundred. Her first time shot usually puts about 97 in the box, and she rarely has to fill more than four empty spaces. A director of the Company is recorded as having observed with great gravity, on seeing this phenomenon, that the girl had only succeeded in putting 99 detonators into the box at her first shot. One hopes that constant practice has now made this young lady perfect.



A, *base charge*. B, *priming charge*. C, *fusehead*. D, *plug*. E, *leading wires*.

These pleasantries of showmanship aside, post-war thinking led the Nobel Division to feel that optimum safety demanded that there must be no handling during manufacture at all. The aim was a plant which would be completely automatic.

That plant is now in operation. It was wholly designed and largely installed by the Division's Research Department under the leadership of Dr. J. D. Pearson. It is a plant which gulps in empty detonator tubes at one end and delivers two cartoned lots of 100 filled detonators every twelve seconds at the other. It is a plant which will produce three or four million filled detonators each week. And in the process it will categorically refuse to continue with its work if a fault or hazard is detected anywhere along the compartmented production line.

Production Sequence

Follow a detonator tube through and see what happens to it. First, the tube makes a precipitate descent from its starting point on the second storey of the plant, through a machine which vaguely resembles the drum for the Irish Sweep draw, to a monorail on the ground floor which will take it to the filling compartments. During the process it has been checked for the accuracy of its internal and external dimensions. The tube which is a "thou" out of trim disappears down the "rejects" tunnel.

Passed as fit, the tube sits comfortably with 199 others in a filling plate and is scooped aloft and borne to the filling plant by the monorail twelve seconds after the last plate has left. The monorail delivers its cargo to a transfer bar, which is operated backwards and forwards by a 6 ft. hydraulic cylinder. The transfer bar runs the length of the eleven steel-walled compartments where explosive and tubes are united. Providing there are no faults, our tube will move into and out of each compartment at twelve-second intervals.

Should, however, a tube happen to sit in the plate upside down, the transfer bar declines to work and flashes a message to the central electronic control—one grasps at the word "brain," but engineers are less enthusiastic about its use. A halt is called to all activities along the line until the fault, clearly and immediately spotlighted on the control board, is remedied.

Dr. Pearson, who had given me a running commentary

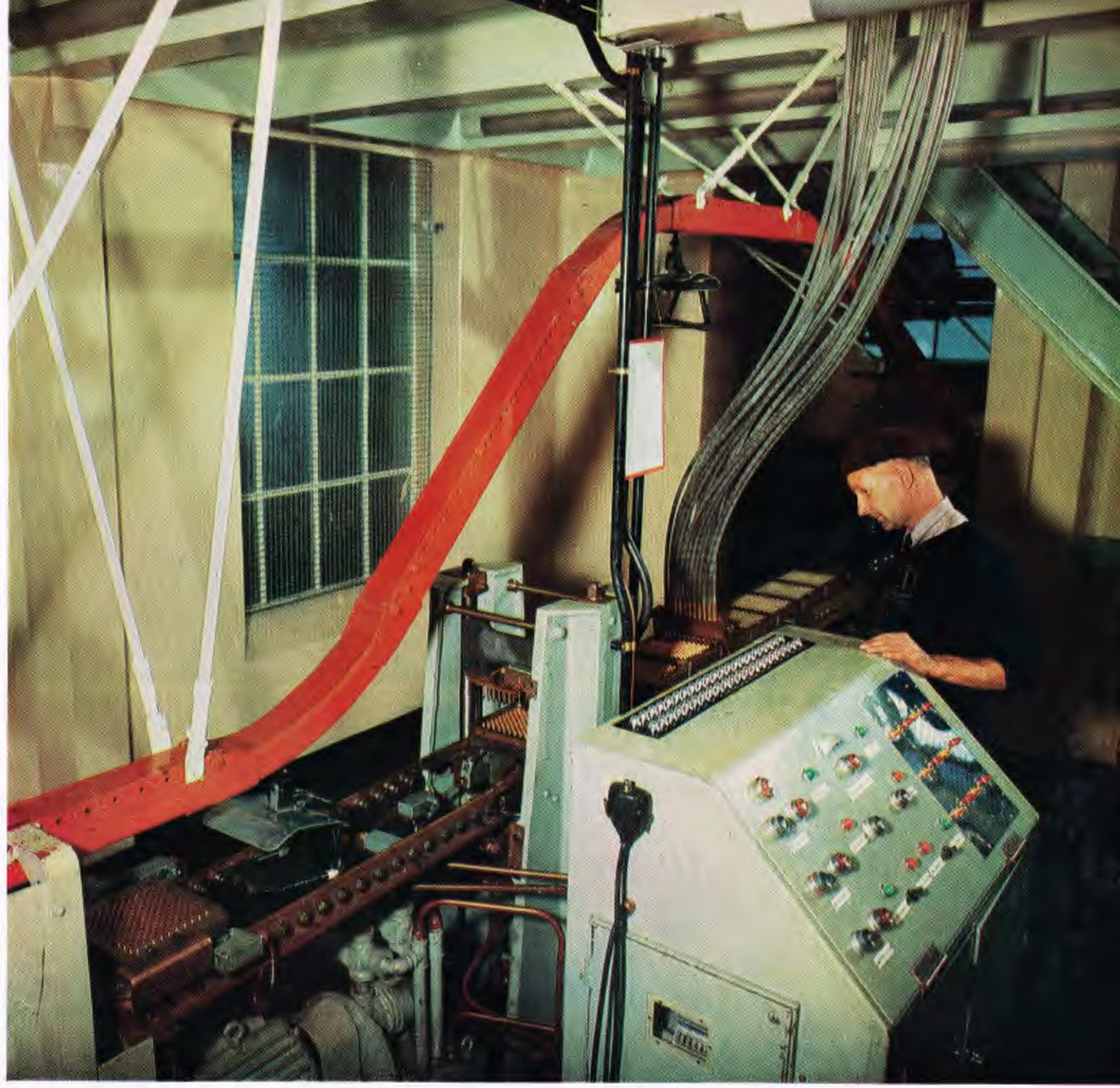
The start of the process. *Detonator tubes are lifted from the bulk hopper, are screened and aligned into twenty pipes for their downward journey to the five stages of inspection.*

so far, handed me over to two of his team, Roy Beveridge and Neil Herbert, and under their guidance I watched—by means of a high porthole and reflecting mirror—as "my" tube and its companions were filled with pentaerythritol tetranitrate.

"That's the explosive that has the punch, but it's difficult to initiate," Beveridge remarked. Twelve seconds later I watched, by the same comfortingly indirect method, two hundred punches descend into the open mouths of the detonators and give the pentaerythritol tetranitrate a light press.

And again, twelve seconds later, as lights on the control board flickered and the transfer bar slid into renewed activity, I saw the priming charge—a mixture of lead azide, lead styphnate and aluminium powder—go into the detonators.

"More sensitive," remarked Beveridge; "goes off more easily." I felt the visitor's natural gratification



A watchful eye *is kept by Mr. Alec Hamilton (Ardeer Detonator Dept.) on the inspected tubes as they slide automatically into the 200 waiting holes in the carrying plates*

for the thickness of mild steel which separated me from this more sensitive product.

I nodded, watching fascinated through my porthole as, on receiving a signal from an automatic level detector, a gleaming metal hand bearing a rubber pot full of explosive emerged from behind a sliding steel panel, stretched four feet to replenish the filling unit, and disappeared as spookily as it had appeared through the steel wall. The "brain" had been at work again. A flashing signal light then told the operator that the rubber pot was empty. He has to be ready to recharge every two minutes or so. Except for fault checking, this is the only bit of human assistance the plant needs.

The processes which follow are the most complicated and the ones to which the research team is still giving much thought. The detonators now contain about a quarter-inch depth of charge, and a fine dust covers the inside surface of the rest of the tube.

(*Continued on page 407*)

People and events . . .

Gomia Factory gets under way

Guy Fawkes Day, 1958, saw the starting up of a very different kind of explosives venture from the original Gunpowder Plot. It was the day chosen for the official opening of India's first commercial blasting explosives factory by the President of India, Dr. Rajendra Prasad. Attending the ceremony were representatives of the Government of India and leaders in India's commercial and industrial life, and from I.C.I. Dr. James Taylor, Mr. R. C. Todhunter, who signed the original agreement with the Indian Government in 1953, members of the Nobel Division Board, and the Nobel Division starting-up party.

The factory has been built by Indian Explosives Ltd., formed in 1953, in which I.C.I. through its Indian subsidiary company is in partnership with the Government of India. I.C.I. (India) Private Ltd., holds four-fifths of the equity capital, the Indian Government the remaining fifth.

* * *

Nobel Division have been responsible for the design, erection and commissioning of the plant, which will have an initial capacity of 5000 short tons a year and will go far to making India self-sufficient in the supplies of explosives needed for mining, railway and road building, quarrying, irrigation and hydro-electric schemes.

The factory site, which covers 2000 acres of hilly jungle, is close to the coal mines of Bihar and Bengal, the principal consumers of industrial explosives in India. A hill which rises about 400 ft. above the general level of the land divides the area in two. East of the hill lies the housing estate for the staff and workers outside the factory boundary. Within are the buildings and plants of the non-danger area and the workshops, laboratories and offices. On the other side of the hill, in the danger area, the actual explosives processing is carried out.

One of the principal raw materials for explosives manufacture, liquid ammonia, is supplied by the fertiliser factory at Sindri, only about 50 miles away. Glycerine, another principal raw material, comes from soap manufacturers in Calcutta.

While work on the site at Gomia has been in progress, demand for commercial explosives, mainly caused by India's five year plan developments, has risen considerably, and plans are already in hand to increase the factory's capacity by half as much again to 7500 tons. A scheme to produce safety fuse at the same site has also been licensed by the Indian Government.

The President of India, Dr. Rajendra Prasad, plants a tree at the opening of Gomia Explosives Factory on 5th November. Mr. J. M. Lall, Chairman of I.C.I. (India), is second from the left and Dr. J. C. Hornel, I.E.L. General Manager, extreme left

Red Exports

The possibility of a ruthless export drive from behind the Iron Curtain against traditional British markets was envisaged by Mr. S. P. Chambers, a deputy I.C.I. Chairman, in a recent lecture given in South Africa. "It is British markets in India and in other sterling area countries that are most vulnerable to attacks from behind the Iron Curtain," said Mr. Chambers. Nor should we assume that the low prices charged were necessarily dumping prices at less than cost, since there were now in existence large new Iron Curtain factories with long runs and low wages.

However, Mr. Chambers was not too gloomy about our export prospects. He thought that as the world's requirements became more and more sophisticated, the inventiveness of our scientists and engineers combined with the flexibility of our industrial organisation would pull us through.

Switching to Science

Last year, 33 university students who decided that they wanted to change from the arts to science were able to do so, without hardship to themselves or to their parents, by taking advantage of the I.C.I. Transfer Scholarship Scheme. Over 75% of these students successfully passed their examinations and have now entered their chosen science honours school.

These encouraging figures have persuaded I.C.I. to extend its guarantee of scholarship funds for a further two years to the universities which originally co-operated in the scheme. These are Cambridge; Imperial College, London; King's College, Newcastle; Liverpool and Oxford. At Oxford the number of scholarships available has this year been extended so that, in common with Cambridge, every college will have a transfer scholarship in its gift. In all, 65 of these scholarships are available, and the universities co-operating now include Birmingham, Bristol and Sheffield.

Last month I.C.I. advertised the scheme in the *Sunday Times*, the *New Scientist* and other journals. The purpose of this publicity was to scotch the idea that it is too late to begin a science course at the university stage. But changing from arts to science in midstream does mean an extra year's study, and this of course is where I.C.I.'s Transfer Scholarship Scheme comes in. The latest information about the scheme is given in the I.C.I. booklet TS4, which is available from Research Department, I.C. House, Millbank.

OTHERS

I.C.I. does not stand alone in the chemical industry. Other firms are both our customers and our competitors. It is therefore proposed to publish from time to time news of their plans and achievements.

British Hydrocarbon Chemicals. The first pile of British Hydrocarbon Chemicals' third ethylene plant at Grangemouth was sunk on 17th October. The new plant, scheduled to be completed by the middle of 1960, will have a rated output of 70,000 tons of ethylene a year; this makes it the largest single ethylene plant anywhere outside the United States. In addition to its present uses in the production of ethyl alcohol and ethyl benzene (for styrene), the ethylene will be polymerised into high-density polythene in a plant due to come into production early next year. British Hydrocarbon Chemicals is jointly owned by British Petroleum and the Distillers Company.

Chemstrand. The £3·5 million Acrilan acrylic fibre plant built by Chemstrand Ltd. at Coleraine in Northern Ireland went on stream in November. The plant, which has been built in just under two years, is designed to produce 10 million lb. of synthetic fibre a year.

British Celanese. Work has already begun, and completion is expected in 9–12 months, of expansions to the oil-cracking plant at the Spondon (Derby) factory of British Celanese, a subsidiary of Courtaulds. The plant produces ethylene and propylene and from them a wide range of petrochemicals. The present capacity is being extended by about 40%.

Joseph Crosfield. The laying of the foundation stone of Joseph Crosfield & Sons' new chemical building at Warrington took place in September. The new building is part of a £5 million rebuilding programme. Initially the plant will manufacture alkaline detergents and silica gel.

Fisons. Fisons have announced that they are planning to enter the agricultural chemicals business in Canada. A new company is being formed called Fisons (Canada). At first it will be mainly concerned with the distribution of U.K.-manufactured goods, but it will eventually begin production with its own plant in Canada.

Monsanto. Plans for large-scale expansion in the production of aspirin and phenacetin at Monsanto's Ruabon factory, and for a new maleic anhydride plant at Newport, which will more than treble production of phthalic anhydride, were announced in October.

International Synthetic Rubber Co. I.S.R. have announced that their new £6 million plant near Southampton for the production of styrene-butadiene rubber went into full production last July. The new plant, it is claimed, will be capable of meeting 27% of the total U.K. demand for all types of rubber, including natural rubber.

Old-established Agents—6

Skandinavisk Sports Agentur of Korsor, Denmark, has been selling hunting, shooting and fishing equipment to Scandinavian sportsmen for nearly a hundred years. For close on sixty years the firm has been dealing in sporting ammunition made by I.C.I. and its predecessors.

The founder was Julius Guldmann. By all accounts he was something of a character. When the shooting season began he would shut up shop and go off in search of game. Customers who complained at finding no one to serve them were sternly rebuked for not having stocked up with ammunition before the season began.

When Guldmann died in 1896 the business was taken over by Mr. Harold Fischer, grandfather of the present owner. Guldmann's brother-in-law, who had joined the firm at the age of 13, served for 67 years, retiring when he was 80.

Prize Tie Design

The theory that women have shocking taste when it comes to choosing a man's tie received a hard knock when the results of African Explosives and

Chemical Industries "Design a company tie" competition were announced. For the prizewinning design is the work of one of the women staff at A.E. & C.I.'s head office in Johannesburg, **Miss Doreen Owens.** Her tie is a nice compliment to the two parent companies of the A.E. & C.I. organisation, I.C.I. and De Beers. I.C.I. is represented by the double wavy lines familiar on the I.C.I. tie, while for De Beers there is the famous Watts Physical Energy Statue on the Rhodes Memorial at Cape Town. Cecil Rhodes was founder and first chairman of the De Beers organisation, and for many years the Watts figure of the man on horseback was used as a trade mark on A.E. & C.I. explosives.

The colour of the new tie is dark green with the wavy lines in gold—the colours used by South Africa in international sport—and the figure of the man on horseback is in silver.

New Fertiliser

A NEW I.C.I. fertiliser called 'KayNitro' has been announced which is the result of many years' research and extensive field trials throughout the country. Billingham will start deliveries early in 1959.

The name 'KayNitro' is derived from the two plant foods it contains—nitrogen and potash. The letter K is the chemical symbol for the element potassium, which is the essential ingredient for all potash fertilisers. The most important use of 'KayNitro' is on the hundreds of thousands of acres of grassland which are dressed with phosphate-rich basic slag each year, for the use of nitrogen fertilisers such as sulphate of ammonia or 'Nitrochalk' in intensive grass production must be balanced by regular dressings of potash. Previously this has meant separate application of potash or using expensive compounds which supply more phosphate than is needed. With 'KayNitro' both nitrogen and potash can be supplied at the same time and in the right proportions in one granular fertiliser, and the potash is in a form which stores well. Besides grassland, it will also have important applications for cereals and "hungry" green crops such as kale and cabbage.

PEOPLE

Three commercial apprentices at Billingham Division made news recently when **Robin Clough** was elected president of the 5000-strong Student Union at Constantine Technical College, Middlesbrough, and **Alistair Faulkner** and **Peter Glover** were elected to the executive of the Union. All three are day release students attending the college.

The five-man steering committee appointed by the Council for Scientific and Industrial Research to assume responsibility for the programme of the Torry Research Station at Aberdeen includes **Dr. David Traill,** Research Director of Nobel Division.

Our March *Magazine* included the story of **Mr. George Hughes** (Nylon Works, Billingham), who won £43 for his suggestion that all mirrors in the works should have painted on them the words "This man is responsible for your safety." Now the idea has caught on with A.E. & C.I. in South Africa too, and George Hughes is the richer by another £5.

In this year's Auto Cycle Union 24-hour national rally, the three-wheeler class was won by **Miss Margaret Pearson** of Metals Division in a Bond Minicar. She also won an award for the best performance by a woman driver and the Midland Centre Ladies' Award.

A former Wilton fitter, **Private Wynne Evans** of the R.A.M.C. in Cyprus, became a local hero when news reached his parents' home in Middlesbrough that he was in hospital after being ambushed by terrorists. The ambulance in which he was travelling was blown up by a mine. In spite of a fractured pelvis and other serious injuries he rendered first aid to his companions for an hour and a half before he collapsed.

Mr. A. R. N. Roberts, the Education Officer for the Regions, has accepted an invitation from the London County Council to serve as a Governor of the Central School of Arts and Crafts. The school, which now has 2000 students, was established in 1896 under the distinguished architect and writer W. R. Lethaby.

Philip Richardson, an Alkali Division laboratory assistant, won the Snaefell 500 c.c. motor cycle race over four laps of the Isle of Man course in September. He averaged 85·06 m.p.h. in this race, which is for newcomers and serves as a qualifying test for the Senior Manx Grand Prix.

A "Do-it-yourself" Plane

WHILE most construction engineers (home workshop variety) are content to build kitchen cupboards, television tables and the like, a C.I.L. machine shop foreman at Nobel Works, **Mr. Roy Davis,** has taken to the air. He started last spring to build his own aircraft, a biplane with a 17 ft. wing span, powered with an 85 h.p. engine. It will cruise at about 150 m.p.h. Mr. Davis is not exactly a beginner when it comes to aircraft construction. At the beginning of the last war, when he was turned down by the R.C.A.F. on sight grounds, he secured a job with the Hawker Aircraft Corporation doing assembly work on the famous Hawker Hurricane fighter. Later he served with the Royal Canadian Navy, and it was not until the end of the war, when he joined Nobel, that he was able to take up flying in earnest and obtain his pilot's licence. Owning a plane is not a new venture for him, but this new plane is the first he can claim as all his own work.

Engineering Controller Retires

MR. **J. E. Braham,** I.C.I.'s first Engineering Controller, retired on 30th September after over thirty years with the Company. He came to London in 1950 from Nobel Division, where he was Engineering Director during the hectic days of reorganisation and expansion after the last war.

Mr. Braham

Not quite all his working life was spent with I.C.I. In World War I he served in the Royal Garrison Artillery, being three times mentioned in despatches. After the war he resumed his interrupted engineering training. Graduating from London University, he went first to the Manchester Steam Users Association as an assistant engineer, and from this dated his lifelong interest in steam boilers. When he joined Billingham in 1928 he became responsible with D. W. Cole for the operation and maintenance of the new high-pressure boilers there, the largest plant burning pulverised cheap coal in the country.

In 1943 he succeeded Sir Ewart Smith as Chief Engineer of Billingham Division, and consequently became concerned with all the plans already afoot for post-war development on Tees-side. Four years later he was appointed to the Nobel Division Board.

There are no headline-hitting stories told of John Braham's career. Talk to his staff and they will speak rather of his sagacity and his unsparing efforts to achieve fairness which won him so many friends throughout the Company, and recall his quite remarkable knowledge of the engineering staffs in all Divisions. His plans for retirement include taking an increasingly active part in the local affairs of his home town in Sussex.

Business and the Arts

THAT business should confine itself solely to the creation of wealth was recently argued by an American writer in the *Harvard Business Review.* This viewpoint was criticised by **Sir Alexander Fleck,** Chairman of I.C.I., in a speech at Newcastle last month.

"I cannot accept that business is nothing more than a machine for producing profits," said Sir Alexander. "Business is not a machine. It is an organisation of men and women directed to specific ends. To assert that the only end is to make a maximum profit is to take too simplified a view of the rather complex needs which have to be satisfied when a man does a job of work. The desire to be of service is really a widespread motive throughout the whole human race."

Sir Alexander went on to list some of the social responsibilities of business, adding: "In a country where taxation has all but eliminated the private patron, and where the State makes a ridiculously small contribution, business might not be so far off its proper beam if it were to give countenance to some small extension of its patronage to the arts."

Animal, Vegetable or Mineral?

THE mystery of a large earthenware pitcher belonging to Wilton Transport driver **Michael Coyle** was solved recently by Sir Mortimer Wheeler, the famous archaeologist, when he visited Billingham to lecture at the local technical college. The jar was found five years ago by Mr. Coyle, who dug it up on land reclaimed from the river at Teesport. Earlier efforts to identify the find yielded only the information that it was not Roman but probably came from the Mediterranean area.

Thanks to the efforts of the Wilton newspaper staff who were interested in the story and to the good offices of the principal of the Stockton/Billingham College, Mr. Coyle was able to take his jar along, and Sir Mortimer readily agreed to look at it. He identified it immediately—a water jar originating from North Africa, probably Morocco, which had most likely been brought here by ship and cast overboard. It was definitely not Roman but of a type sometimes mistaken for Roman. Specimens in this country were usually dredged from river beds (this before he was told the jar had been found on land reclaimed from the river through dredging). Sir Mortimer dated the jar as nineteenth century and thought it a good enough specimen to be of interest to any local museum.

Technology Project Completed

"LIKE the Channel Tunnel, the *History of Technology* project was obviously a good thing and badly needed, but it looked to me like one of those imaginative enterprises which never came to anything in the end." So wrote Dr. Gordon Cook when he reviewed Volume II of the "History" for us in the *Magazine,* and there were many in the early days who shared his views. The appearance last month of the fifth and final volume of the mammoth work shows just how wrong they were. To mark the successful end of the eight-year project a reception was held at I.C. House on 12th November attended by **Sir Alexander Fleck** and Sir Cyril Hinshelwood, President of the Royal Society.

The five-volume work is the result of collaboration between the Company and the Clarendon Press. I.C.I.'s part has been to see to the planning and editing and to commission the many contributions and extensive art work. The Clarendon Press undertook the publication at its own risk. *A History of Technology* tells the story of how things were made—and what things. It ranges from prehistoric times up to the beginning of the twentieth century. To go beyond that, say the editors, it would have been necessary to deal with events too recent to be seen in proper historical perspective.

* * *

Here are some facts and figures. The five volumes contain over 4000 pages, illustrated with more than 2500 line drawings and 200 pages of half-tone photographs. There are 134 chapters, each written by a distinguished authority. Sales have surprised even the publishers; Volume I, published in November 1954, has now been reprinted for the third time. Many copies have been sold abroad, and in the United States the Library of Science Book Club has acquired rights to produce an unabridged edition for its members.

The original editors were **Dr. Charles Singer** and **Dr. E. J. Holmyard.** In 1954 they were joined by **Dr. A. R. Hall.** A year later, after the publication of Volume I, **Dr. Trevor Williams** (editor of *Endeavour*) joined the team as managing editor.

I.C.I.'s Apple Orchards

IT may come as a surprise to many readers that a company which deals with chemicals should own a successful fruit plantation at Fernhurst in Sussex, which last year produced crops worth £35,000. This year an even larger crop has been put in store for marketing later in the season. The apple orchards were planted in 1946. Sir Alexander Fleck planted the first tree—a Cox's Orange Pippin. Now the plantation extends over 70 acres.

The commercial fruit grower has many problems which do not affect the amateur, not the least being that he has to make a living by selling his fruit. Growing fruit on a large scale encourages pests and diseases which do little damage to isolated trees. This, **Dr. F. C. H. Gayner,** pomologist of Plant Protection's technical service department, told us, is where the Fernhurst orchard comes in. Here fruit growers

NEWS IN BRIEF

Records. E.M.I. (Electrical and Musical Industries Ltd.), the greatest recording organisation in the world, use I.C.I.'s 'Corvic' made at Hillhouse Factory for 97% of their H.M.V., Capitol, Columbia, Parlophone and M.G.M. long-playing records.

Safety Boots. During a recent Safety Week drive at Billingham to sell 1000 pairs of a new type of safety footwear, which was offered with a nine months' guarantee, the target was exceeded by 444 pairs.

Poodle Pink. All part of a day's work for I.C.I.A.N.Z. Dyestuffs Technical Service man, Mr. Bruce Bennie, was supplying advice on how to dye a white poodle pink. The inquirer was advised to use a colour shampoo with a suspicion of Rhodamine BS, and the poodle in due course stopped the show at a big charity mannequin parade.

Polyester Fibre in Holland. A new plant for the production of Polyester fibre under the name "Terlenka' set up at Emmen in Holland by I.C.I.'s Dutch licensees, Algemene Kunstzijde Unie (A.K.U.), was opened recently by Prince Bernhard of the Netherlands.

'Luron' heads the List. The winning catch in this year's National Angling Championships held at Spalding was made by a Lancashire miner, Mr. Bill Hughes, using a 'Luron' line.

Safe Driving. Ardeer Factory drivers, who drove more than half a million miles last year, scored a 100% success in the Ro.S.P.A. safe driving competition. All 43 drivers and mates had an accident-free year. For the Nobel Division as a whole their 182 entrants had been involved in 30 accidents, but in only three cases were they held to be blameworthy.

Silicones at Renfrew Airport. A display unit which features I.C.I. silicones has been set up in the arrival and departure hall at Renfrew Airport. A stuffed duck dominates the display, underlining the theme that rain pours off textiles and masonry treated with I.C.I. silicones "like water off a duck's back."

Fan Mail. The caretaker of I.C. House, Melbourne, I.C.I.A.N.Z.'s new skyscraper headquarters which is being officially opened by Sir Alexander Fleck on 11th December, had a post one morning which would have made a film star green with envy. The reason? 250 replies to an advertisement for office cleaners for the giant new building

Wages at Wilton. The number of payroll employees at Wilton who have opted to have their wages paid through a bank has grown from 191 at the start of the scheme last May to just three short of 500 by the end of October.

First-aiders. Alkali Division first aid team gained second place in the London finals of a national First Aid competition held under the auspices of the Casualties Union. One hundred and sixty-two teams from England and Scotland entered the competition.

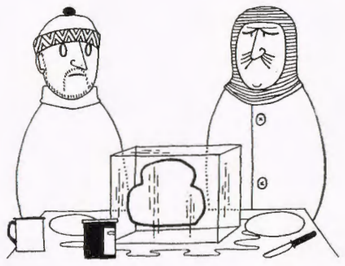
from all over the world can see for themselves how I.C.I. chemical products are helping to grow clean crops free from the ravages of pests and diseases.

Plant Protection has not only pioneered new chemicals, it has also been responsible for introducing new techniques. Before 1948, fruit growers used to spray their trees during the winter with caustic tar oil to kill pests in the egg stage. In 1948 Plant Protection introduced spring spraying with 'Gammexane' to kill the aphids and caterpillars after they had hatched from the eggs. It has proved so successful that only a small proportion of the fruit acreage in this country is still sprayed during the winter. More pioneer work by the Plant Protection staff has resulted in the use of air blast sprayers for applying fungicides and insecticides, a technique which is now spreading rapidly through the fruit-growing industry.

The apple grower has a difficult problem in deciding what varieties to grow. Fortunately tastes do not change very rapidly. At Fernhurst the dessert apples are largely Cox's Orange Pippin and the cooking apples Bramleys' Seedling.

Off the Ice

In the Antarctic today they get fresh bread off the ice, thanks to 'Visqueen.' Quick-frozen, freshly baked bread sealed in 'Visqueen' polythene film is proving a great success with the men of the Australian Antarctic Expedition at Mawson on the edge of the five million square mile Antarctic ice cap. The explorers have found 'Visqueen' is completely unharmed and protects food even in temperatures as low as 70° below zero—that is, 60° below normal for frozen food storage. Because of this 'Visqueen' packaging is being used for the all-important emergency food packs dumped at planned points along exploration tracks in the Antarctic. Each of the food packs contains enough emergency rations to keep a man alive for twelve days. The



expedition has also used 'Visqueen' film to package delicate scientific instruments, keeping them both dust- and waterproof. In Australia 'Visqueen' is made at I.C.I.A.N.Z.'s Deer Park factory, New South Wales.

Colour at the Motor Show

In the thick of the crowds on the opening morning of the International Motor Show at Earls Court were two men with an important mission—to check the colours of every car on view at the show in order to get an exact picture of this year's colour trends. The two men were **Mr. V. R. S. Turner** of the Colour Standards Section at Stowmarket Factory and **Mr. M. J. Alston** from the Slough Overseas Sales Department. This survey is undertaken each year by Paints Division, who are the main suppliers of finishes for the British motor industry, and the results are sent out to the national newspapers and motoring journals and abroad to the Division's network of overseas agents.

Lighter and brighter—this is the experts' view of the present trends in car colours. In particular coffee and cream, both individually and in two-tone combinations, were extremely popular. Two-tone schemes in general accounted for nearly half the cars on view. All-black cars were conspicuous only for their rarity—a mere 11 out of the 303 cars on view. Of the full colours, reds and maroons were still the most popular, although statistics show that they have slipped a bit from their high position in 1957, while bright blues seem to be on the up and up.

Tribute from the Fireman

Our picture of the rehabilitated veteran locomotive *Talyllyn* published in the September *Magazine* prompted a letter from one of our readers, **Mr. Roy Smith,** an assistant technical officer in the Alkali Division Research Department. Mr. Smith is a member of the Talyllyn Railway Preservation Society, formed in 1951 to save from extinction the oldest steam-worked narrow-gauge railway in the world running a continuous passenger service. Much of his spare time and holidays are spent working as a fireman on this private railway in the heart of Wales, and he had the privilege of firing *Talyllyn* on a special train carrying members of the Society on the occasion of the annual general meeting at Towyn, the coastal terminus of the 7-mile track.

"As fireman," writes Mr. Smith, "I really can speak from personal experience of the excellent work done in rebuilding this 93-year-old locomotive, in which I.C.I. copper (for the firebox plates and stay rods) has played no small part."

Let's blame the Weather

Does weather affect literary inspiration? This would seem to be the case from a reading of the seventeen articles submitted in this year's Holiday Article Competition, none of which, the Editor regretfully reports, were good enough to publish. The prize of £30 is therefore still in the kitty.

Several of the competitors wrote quite frankly about the depressing times they had had in the rain. Others tried to ignore this side of their holidays. But none seemed to have encountered those specially enjoyable experiences shared with other people—often casual acquaintances—on which a good holiday story is founded.

ANSWERS TO QUIZ

I. (*a*) Prince Charles, (*b*) Father Georges Pire, (*c*) Derek Ibbotson ran first *exact* 4 min. mile 3rd Sept. 1958, (*d*) (i) Theodore Roosevelt, (ii) William of Orange, (iii) Abraham Lincoln, (*e*) (i) Turkey, (ii) Robespierre, (iii) Aleister Crowley, (iv) John Dillinger, (v) Attila the Hun, (vi) Thomas Carlyle.

II. (*a*) *The Mousetrap*, opened 25th Nov. 1952, still running, (*b*) B.B.C. V.H.F. stations, (*c*) half a ton approx., (*d*) (i) one is a pig, the other a butterfly, (ii) one is a bread-and-butter letter, the other a drink, (iii) one is a constellation, the other a place in Hants, (iv) one is a variety of wheat, the other a variety of grass.

III. (*a*) 1939, (*b*) cribbage, (*c*) Sept. 1947, (*d*) 1st January 46 B.C., (*e*) jetsam.

IV. (*a*) (i) Copenhagen, (ii) Venice, (iii) Edinburgh, (iv) Stockholm, (v) Chicago, (*b*) Verdi's *Aïda*, (*c*) Russia, 40 miles across Bering Straits from Alaska, (*d*) cat (no licence needed), (*e*) (i) British—a million millions, U.S.A.=a thousand millions, (ii) both are ½ pint, except in northern and western England, where a gill is ½ pint, (iii) Scottish—0·376 gallon, Glasgow=0·5 gallon, (*f*) Bermuda.

V. (*a*) Hand with no honours in bridge, (*b*) off Newport, Rhode Island, (*c*) in golf—albatross is 3 under bogey, eagle 2 under, (*d*) (i) Carlisle, (ii) Hull, (*e*) Coniston Water.

VI. (*a*) ten—U.K., Norway, Sweden, Denmark, Holland, Belgium, Luxembourg, Lichtenstein, Monaco, Greece, (*b*) fill 5-gallon jar, fill 3-gallon jar from it. Pour 3 gallons so obtained into river. Pour 2 gallons left in 5-gallon jar into 3-gallon jar. Fill 5-gallon jar again, and top up 3-gallon with 1 gallon from 5-gallon jar, leaving 4 gallons in 5-gallon jar. (*c*) Jael drove a tent peg through his head. (*d*) (i) 1976·5 yards, (ii) 2240 yards, (iii) 11,000 yards, (*e*) 4 at the time of going to press, +2 rocket cases.

NEW APPOINTMENTS

Some recent appointments in I.C.I. are: **Alkali Division:** Mr. D. R. Debes (Winnington Works Manager), Mr. G. R. Barr (Wallerscote Works Manager). **Dyestuffs Division:** Mr. R. C. Spooncer (Assistant Chief Engineer). **I.C.I. (India):** Mr. R. Coleman (Director). **I.C. Insurance Ltd.:** Mr. T. M. Toft (Accountant). **The Regions:** Dr. J. P. Dickson (Assistant Sales Controller), Mr. P. J. Massey (Regional Sales Manager, Paints Dept., Southern Region), Mr. P. F. Overbury (Deputy Regional Manager, Southern Region).

Correction: The General Manager of I.C.I. (South Africa) is Mr. J. T. M. Davies and not Mr. J. T. M. Hughes as stated in last month's *Magazine*.

THE QUIET REVOLUTION (*continued from page* 401)

This dust could easily cause an explosion. Two hundred slim curving polythene tubes attached to special nozzles slip into the tube mouths in the next compartment, the dust is brushed off the inner walls, sucked by vacuum up the pipes, and desensitised in a tank of starch solution.

And finally the detonators are extracted ingeniously from their holding plate and appear, duly cartoned, with almost monotonous regularity at the final station. The operation of this machine can be observed in close-up on a television screen.

Every conceivable safeguard has been introduced. The principal one, of course, is the refusal of the electronic control to permit further activity of any kind until a single fault anywhere along the line has been rectified. I am told that in handling 300,000 detonators on one shift there are 1,200,000 chances of a fault occurring. The "brain," if we may be permitted the term, would spot any one of them and would automatically inhibit any further action anywhere until the fault was cleared.

"Brain" or otherwise, the electronic apparatus which carries out the "thinking" in the automatic detonator plant at Ardeer is a unit whose complexity and ingenuity would delight the soul of every electrical engineer. It is the outcome of a fine piece of development work by Research Department which enables electrical signals of very low energy values to be used with complete safety in an explosive building. On each cycle of twelve seconds (assuming no faults) it sends, receives and records 850 separate signals. And in the next twelve seconds it is off again on the same round of efficient activity.

What will Nobel Division gain by automatic detonator manufacture? Three things. First, they will obtain a substantial increase in productivity; second, they will turn out a more uniform product; third—and most important—they will fulfil a fundamental moral duty to make the job as safe as humanly possible for employees.

Redundancy? The question hardly arises. Normal wastage at Ardeer will be sufficient to cover the numbers involved in job changes.

The quiet revolution is not quite complete. The plant is not yet on full production. But it is likely to be soon. It will have the distinction of turning out in millions one of the few products which in this day and age cost less than twopence—an I.C.I. plain detonator.

Men with Ideas—II

Arthur Ellis and Thomas Hewitson

In the chemical industry great importance is attached to the insulation of pipes and vessels. Lagging, as it is called, is a full-time occupation for a squad of men on a site like Wilton, where there are miles of pipes and hundreds of vessels to be kept effectively insulated.

Two of these men, Arthur Ellis and Thomas Hewitson, both chargehand general workers in Services Works, recently struck on ideas that won them big awards under the Suggestion Scheme: £350 for Arthur, £120 for Tom.

Arthur Ellis devised a better way of making lagging mattresses for certain applications. He found that by using a wire-netting "box" filled with insulating material it was necessary to cover only one side of the mattress with asbestos or glasscloth. This process not only means a saving in time and materials but it produces a more uniform mattress.

Tom Hewitson's idea sprang from his experience of having to break away flange lagging on pipes and vessels so that maintenance work could be done, and of having to renew the lagging afterwards. The renewal was a lengthy job: first magnesia slabs had to be fitted over the flange, over this some wire-netting, then a hard-setting compound. Tom found a way of making preformed flange covers in the workshop which could be clipped on to the flange with a band. Now when they have to be removed the band is cut and the covers remain intact, to be refitted as soon as the maintenance work is done.

Modern Marvels—11

THE INFRA-RED SPECTROPHOTOMETER

By L. A. Duncanson (Heavy Organic Chemicals Division)

Yet another tool of chemical analysis is here described. The principles of the infra-red spectrophotometer are similar to those of the ultra-violet spectrophotometer described last month: one uses the ultra-violet wavelength shorter *than the light we see, the other the infra-red wavelength* longer *than red light. In each case the amount of radiation absorbed by the sample under analysis gives a pointer to its composition when compared with the radiation absorbed by "control."*

Last month I described how chemists use instruments called ultra-violet spectrophotometers to measure colours which are not visible to the naked eye. These "invisible colours" arise due to the absorption by molecules of wavelengths of light which are *shorter* than those at the violet end of the visible spectrum. There are, however, other "colours" than these which are of great importance to the chemist and which cannot be seen by eye. These occur beyond the other end of the visible spectrum; that is, they are due to absorption of *longer* wavelengths than red light.

These long-wavelength light rays are known as infra-red radiation, and the measurement of their absorption by chemical substances is known as infra-red spectrophotometry. This article will tell how the absorption of infra-red radiation by chemical substances is measured, and of the usefulness of such measurements to the chemist. First, though, let us consider a simple experiment which tells us something about the nature of infra-red radiation.

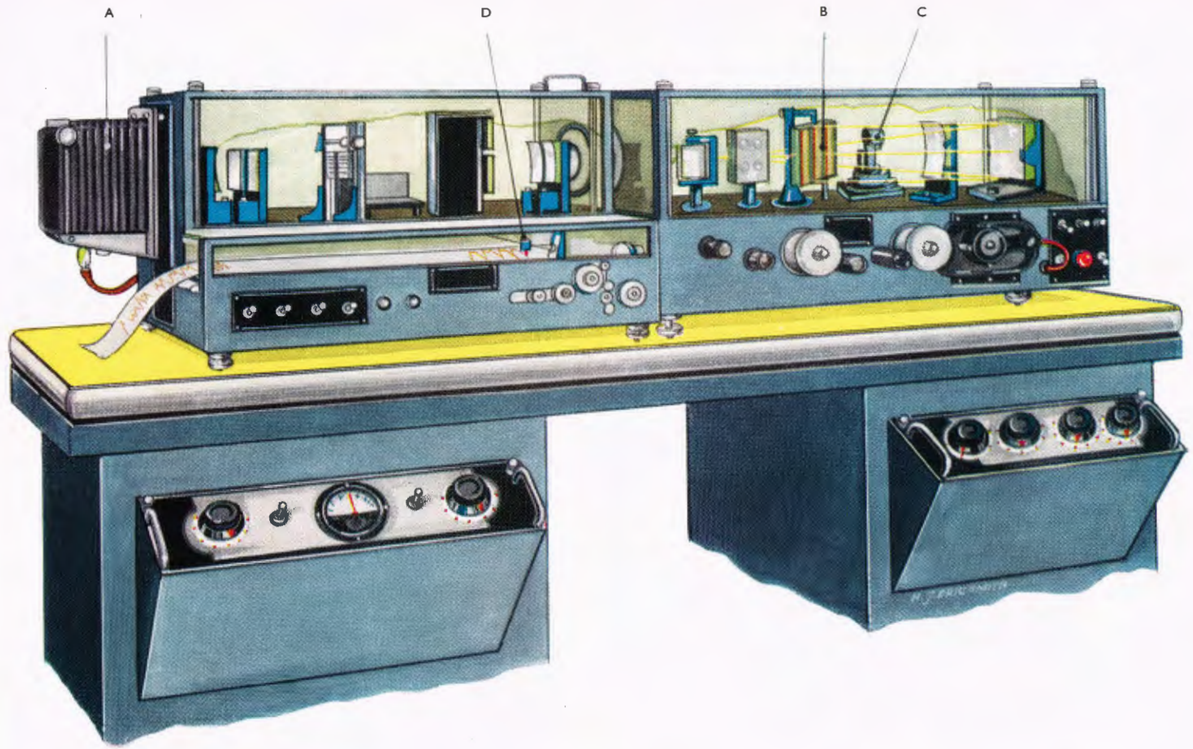
If one sits in front of a glowing electric fire, two sensations are immediately experienced. One's eyes see the brightly glowing element of the fire, and secondly the heat radiating from it is felt on the skin of the face. Now, if a sheet of glass is held between the face and the fire most of the heat is cut off, although the glowing element can still be seen. Even with the eyes closed it can be felt whether the glass is in front of the face or not by the change in the amount of heat falling on the skin.

This experiment demonstrates both the absorption and detection of radiation of different wavelengths. The eyes are sensitive to and can detect only the wavelengths of light which we know as visible radiation, whereas the skin is sensitive to the heating effect which is produced when the longer-wavelength infra-red radiation falls upon it. The light emitted by the fire includes both visible and infra-red radiation; but the sheet of glass, while transparent to visible light, is opaque to the infra-red rays. In other words, glass absorbs infra-red radiation, "colour" to which our skins but not our eyes are sensitive.

Now the chemist may, like anybody else, use his sense of feeling to decide whether things are hot or cold, but the delicacy with which he needs to measure infra-red radiation requires a more subtle heat sensing and measuring device than the skin.

The instrument he uses is called an infra-red spectrophotometer, the working principles of which are similar to those of an ultra-violet spectrophotometer. A source of infra-red radiation is incorporated in the instrument, and this is usually an electrically heated filament. The radiation emitted by this source is split into a spectrum of different wavelengths, usually by passing it through a prism. Now, our experiment with the piece of glass in front of the fire showed that glass is not transparent to infra-red rays. Another material has therefore to be used for making the prism, and the most usual is common salt. Large single crystals of common salt, measuring several inches, are cut and polished to form prisms which are transparent to heat rays. The intensities of the infra-red rays in the spectrum produced by such a prism are measured in the spectrophotometer by a heat-sensitive device such as a thermocouple. The thermocouple converts heat energy into electrical energy, which is electronically amplified and recorded.

In the latest types of infra-red spectrophotometers the prism is replaced by a diffraction grating. This is a metal mirror with many closely spaced and carefully shaped parallel grooves cut in its surface, the effect of the grooves being to split the light reflected from the surface into its constituent wavelengths. An infra-red spectrophotometer containing a diffraction grating is illustrated in the picture.



A is the source of infra-red radiation. In the left-hand compartment a series of mirrors splits the beam into two parts. Each is alternately focused, several times a second, on to the spectrometer in the right-hand compartment. Light entering the spectrometer in this way falls on the diffraction grating B and is dispersed into a spectrum. Slow rotation of the diffraction grating causes the spectrum of each beam to move across the heat-sensitive element C. This element converts heat energy into an electrical signal. Absorption of certain wavelengths by a sample in one beam produces an alternating signal from C, which is used to drive a shutter into the other beam until balance is restored. The shutter is linked to the pen D, which thereby draws a continuous record on a moving chart of the intensity ratio in the two beams as a function of wavelength.

By placing a chemical substance in such an instrument the wavelengths of infra-red radiation which it absorbs can be quickly and precisely measured.

The importance of such measurements can be seen when we enquire into the question why substances absorb infra-red radiation. First we can picture a molecule as a group of small particles, the atomic nuclei, cemented together by a cloud of electrons. We saw in the earlier article that ultra-violet radiation is absorbed by the vibrating electrons. Now, infra-red radiation is absorbed by vibrating atomic nuclei in a similar manner. As the nuclei are relatively heavy they vibrate more slowly than the electrons, in fact with frequencies corresponding to the undulations of infra-red light waves. And the wavelengths of absorbed infra-red light, being closely related to the frequencies of vibration of the atoms in a molecule, uniquely characterise molecules of different types.

For this reason the infra-red absorption spectrum is often referred to as the finger-print of a molecule. Knowledge of these molecular vibrations can give much information about molecular structure, telling the chemist something about the types of atoms present and how they are joined together in molecules.

Because each type of molecule has such a characteristic "colour" when studied in an infra-red spectrophotometer the instrument is a powerful analytical tool. Thus the constituents of mixtures can often be identified and analysed from their infra-red absorption spectra much more quickly than by conventional chemical methods. This is why infra-red absorption methods are often used to control chemical processes.

In general, spectrophotometers give the chemist a much broader view of "colour" than is obtained by eye alone. It is presumably not accidental that our eyes are able to detect only such a small range of wavelengths, because the atmosphere around the earth is opaque to a lot of the infra-red and ultra-violet radiation emitted by the sun. Our eyes in fact have developed sensitivity only to the light which most readily reaches the earth's surface.

The World of Toys

The British toy industry is today composed of a large number of highly competitive small firms and is second to none, having assumed the lead held pre-war by Germany. The modern range of plastic toys owes a lot to I.C.I. plastics and in particular to the I.C.I. discovery of polythene.

Illustrations from models supplied by Hamley Bros. Ltd. of Regent Street, London, W.1

A very special giraffe, *made of foam rubber. Its neck will twist and bend to any position and stay put.* 19s. 6d.

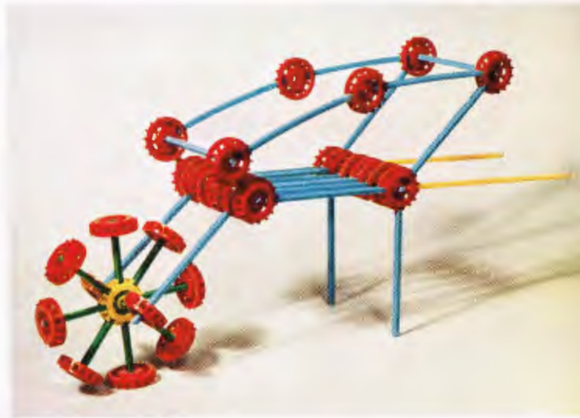
"The Jabberwock, *with eyes of flame,*
Came whiffling through the tulgey wood,
And burbled as it came!"
5s. 11d.

A foam rubber guardsman *who never faints on parade and can take up any position.* 9s. 6d.

This elephant, *ambles along just like a real one and blows water out of its trunk.* 17s. 11d.

Polythene beads for baby. *They can be pulled apart and snapped together again.* 10s. 6d.

Teaching baby the time. *The yellow numbers will fit only into the correct place on the clock.* 17s. 11d.



A build-it-yourself *for the 7-year-old. Amusing polythene components that can be put together in several shapes.* 12s. 11d.

A new line this year—*chunky wooden components finished in high-gloss plastic. A build-it-yourself for the 5-year-old.* 25s.

SPEED

LEFT: **A build-it-yourself** *polythene two-masted schooner, called the "Black Falcon."*

BELOW: *A build-it-yourself B.O.A.C. Britannia. The two constructional kits have some 105 components between them. 13s. 11d. and 17s. 6d.*

Vintage cars *assembled from construction kits.*
ABOVE: *A 1904 Darracq.*
RIGHT: *A 1911 Rolls-Royce. Each car costs only 2s.*

Sports M.G. *driven by electric motor, with controls beside the driver's seat. 30s. 4d. with battery.*

The all-conquering Vanwall *racing car assembled from construction kit. 7s. 11d.*

WAR

Space missile gun. Shoots suction darts that stick to their objective. 10s. 11d.

Nike rocket launcher. Fires the rocket by a spring. 6s. 11d.

Night Rider pistol with plated butt. 7s. 11d.

The Red Star rifle, beautifully finished. 21s. 11d.

Polythene tank transporter carrying a jeep. 17s. 6d.

Jeep towing field gun. 17s. 6d.

VX rocket, a winner last year and still a best seller. Water loaded, it fires a rocket 100 *ft. into the air. Made of nylon.* 25s.

Cowboy "Swoppets" *are new this year and selling fast. Made of polythene, they take to bits on the poppet system and can be put together with heads, arms, legs, and even pistols, on different bodies.* 27s. 6d. *per set or* 2s. 11d. *each.*

ARGENTINA TODAY

By a special correspondent

What did Perón try to do? Why did he fail? What are the aims of the present government? Why are exports of Argentine beef declining? These questions are answered simply and clearly by a writer with a long and intimate knowledge of Argentina.

ARGENTINA—what does this name mean to the average "man in the street" in Britain, what vision does it conjure up in his mind? From my observations it seems to present a confused picture of a tropical country, populated by dark-skinned people who spend most of their day asleep in the hot sun under broad-brimmed sombreros; the country of *mañana*; the land of unlimited supplies of beef; the home of the tango; Buenos Aires, a city of unparalleled vice; revolutions two a penny; and the one-time haunt of a headline-hitting dictator and his glamorous partner.

It all sounds so exciting, so romantic—and it is so utterly wrong! The visitor from South America is often forcibly struck by the ignorance displayed by so many people in Britain on the subject of Argentina, and indeed of all countries in Latin America, which in the popular mind are hazily grouped into an indistinct mass situated vaguely somewhere south of the U.S.A. And yet here we have a very large area of the world richly endowed with a vast store of natural resources, as yet largely untapped, and destined to play an increasingly important role in the affairs of the Western world.

Let us therefore take a closer look at Argentina, which, with its neighbour Chile on the other side of the Andes, occupies the southernmost portion of the continent, and is the second largest country in South America. It has an area of 1,080,000 square miles (or five times that of continental France) and stretches from the subtropical lowlands of the north to the Antarctic zone some 2300 miles to the south. Geographically it has everything—wide expanses of grassy plains and grazing lands, tropical forests, wide navigable rivers, an extensive coastline, lakes and mountain ranges of extraordinary beauty (including the Aconcagua, the highest peak in the western hemisphere); but it is mostly the fertile lowlands from which the principal wealth of Argentina—grain and livestock—is derived.

The population of Argentina now exceeds the 20 million mark—it has increased by 12% in the last five years—and that of Greater Buenos Aires, its modern capital city, numbers 5·7 million. Contrary to popular belief, 97% of its inhabitants are of European stock, largely Spanish and Italian, and therefore white: it is the Argentinian's proud boast that his country is the whitest south of Canada. The original Indian stock has largely been exterminated with the advance of the white settler in the wake of the Spanish colonisers, and those who survived have been absorbed into the Argentine population, especially in the north and west.

National wealth is more evenly distributed than in most Latin American countries, and one does not see in Argentina the wide extremes of prosperity and poverty so often associated with South America. The country boasts the oldest and largest middle class south of the United States, and its literacy rate ranks with that of the most advanced nations of the world. Its population has the highest standard of living in Latin America.

Argentina's history dates back to the sixteenth century, when the Spanish colonisation began. From the first, its development by Spain was neglected, the attention and efforts of its new masters being centred on the silver mines in Peru; what is today known as Argentina was looked on as a possible new route to the legendary and fabulous riches of the Inca empire. Not until the latter part of the eighteenth century was the Viceroyalty of the River Plate created, but even after that development Spanish misrule and neglect continued to stifle the growth of the country and fired the aspirations to independence of the colonists.

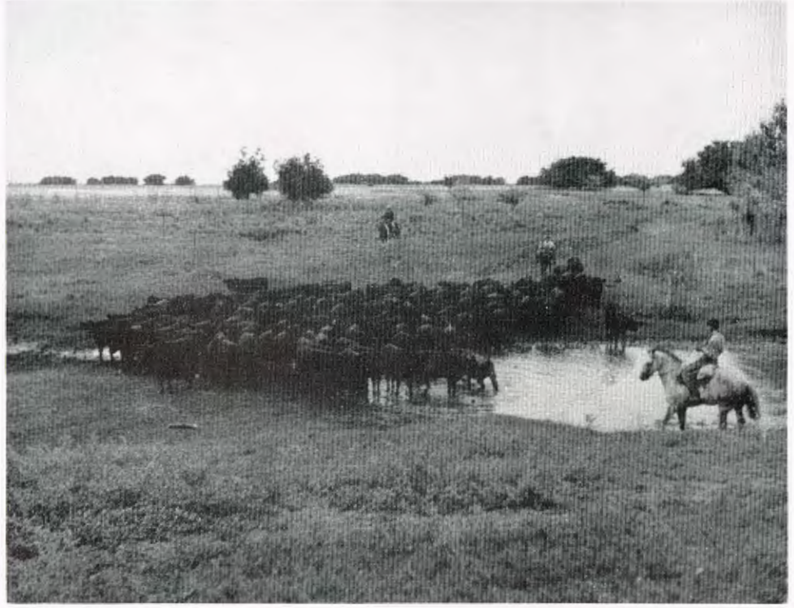
It is not generally known in Britain that two British expeditionary forces, under the respective commands of Generals Whitelocke and Beresford, at the height of the Napoleonic Wars, when Spain was temporarily the ally of the French, invaded and actually held Buenos Aires for brief periods during 1806 and 1807. It was the citizens' militia which expelled the invaders on both occasions, and this success opened the eyes of the colonists to their own strength. This led to a revolutionary movement which in 1810 demanded and secured self-government, though it was not until 1816 that a formal declaration of independence finally severed the link with Spain. Argentina thus became one of the first of the Spanish colonies to win its freedom.

Almost forty years of anarchy and civil war followed until 1853, when union was finally achieved and a constitution adopted which with few changes is still in force today. The system of government is republican, representative and federal, and is largely modelled after that of the United States.

Basically an agricultural country, Argentina's wealth developed rapidly in the latter part of the eighteenth century and the early years of the nineteenth. Immigrants, chiefly from Spain and Italy, poured into the country at a high rate, and the income flowing from its ever-increasing exports of grain, beef, hides and wool steadily augmented its wealth. By the end of the first world war, spurred on by the shortages of manufactured goods during the period of hostilities, the process of industrialisation had begun and has continued at an accelerated pace ever since. This happens sooner or later in the development of all new countries. The desire to be self-sufficient and not dependent on foreign supplies for consumer goods is very understandable. Although many mistakes are committed in the name of self-sufficiency, it is an urge as impossible to arrest as it was in years gone by in the growth of the great industrial countries of the modern world, such as Britain and the United States.

It is this development, this change-over from a wholly agricultural economy to an industrial one, which provides the background for the serious economic plight in which Argentina today finds herself. We see a country enormously wealthy in natural and human resources but facing a financial crisis unparalleled in its gravity. This is the direct result of a long period of misrule which began fifteen years ago when a hitherto obscure army officer, Perón, started to play an increasingly important role in the government of the country and eventually in 1946 succeeded in having himself elected president, continuing to rule the nation as a virtual dictator for ten years.

The secret of Perón's power was simple—he bought and retained the support of the masses by an unrestrained and economically suicidal policy of constant wage increases and other social benefits. Now, everything that can be done to improve the lot of the salary and wage earners is a good thing in any country; and in the Argentina of 1945 there was much to be done in this direction. But when such a policy is implemented without regard to the ability of a country's finances to absorb such higher costs and is unaccompanied by any increase in the national output it can only lead, as indeed it has in Argentina, to disaster.



Beef cattle *on free range in the Argentine. Fenced-in areas usually embrace several hundred acres.*

The purchasing power of the Argentine peso, if estimated at 100 in 1944, fell to 10 by 1957 and is even lower today.

Perhaps the greatest damage done was to the country's agricultural economy, hitherto the mainstay of its prosperity. By overstimulating industrialisation and deliberately neglecting agriculture and livestock breeding, which Perón airily dismissed as largely serving the needs of foreign markets, the country's output of these products was seriously diminished and its foreign exchange earning capacity crippled. This occurred precisely at a time when the opposite should have happened and everything possible should have been done to increase earning capacity in order to be able to pay for the importation of the capital goods required by the process of industrialisation.

. . . mines in Peru

Thus the farmer was discouraged in every way. The government, the sole purchaser of his produce, fixed agricultural prices at unremunerative levels in an effort to keep the rising costs of living down and to earn huge exchange profits on exports, while the producer had to cope with constantly increasing wages and labour shortages. As a result Argentina's exports dwindled as the acreage given over to cereals and livestock raising was gradually reduced. For the last three years, notwithstanding import controls, Argentina has imported more than it has been able to export, with a consequent drain on its foreign exchange reserves.

Perhaps this would be the point to say a few words about the situation regarding beef sales to Britain, Argentina's biggest export market. In recent years the shipment of high-quality chilled beef has been resumed, replacing the unpopular frozen beef which had to be shipped during the war period and the years of meat rationing which immediately followed.

People often ask why shipments in recent months have decreased, provoking shortages and price increases in Britain. The answer is partly explained by the decline in cattle breeding resulting from Perón's policies. Beef shipments have only been maintained in recent times at their relatively high level at the expense of the reproductive capacity of the herds, and experts agree that too many heifers and cows are being slaughtered. Cattle stocks have declined from 46·9 million head in 1956 to an estimated 37·7 million now. It is justifiably feared that this trend can only mean a serious curtailment in future beef supplies for domestic consumption and export. To aggravate the export problem further, the demand for meat inside Argentina is increasing steadily with the constant rise in population, which boasts the highest per capita consumption of meat in the world.

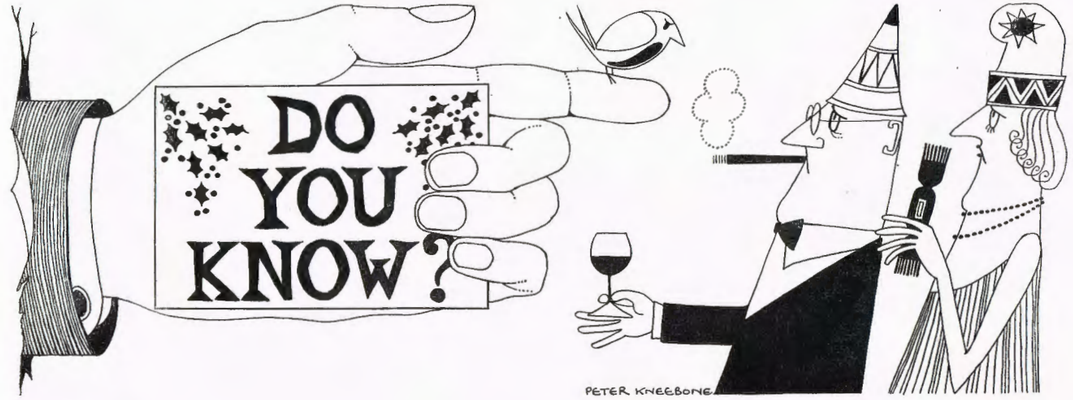
This, then, was the situation brewing when the Argentine nation, to its eternal credit and by its own efforts, overthrew the Perón government in September 1955. A caretaker government, basically military, ruled for the next thirty months and started the process of recovery. It paved the way for free elections, which were held early in 1958, and as from May last a constitutional government again has ruled.

The gravity of the political, social and economic problems facing the new government cannot be disguised, and it is too much to expect that the mismanagement of ten years by the Perón régime can be set straight overnight. The road to recovery will be long and painful and will demand many sacrifices from a people who have so far never been called on to make them. But the basic ingredients of success are there—a wealth of natural resources crying out for development and a young, proud and hard-working people who will respond to inspired leadership. No one who has visited Argentina can doubt that. Although the next few years may be critical and difficult, the country will eventually find its way out of its present predicament, and the evidence is that the present government is determined to set matters straight at all costs.

. . . notwithstanding . . .

Britain has maintained the closest trade relations with Argentina ever since the first commercial treaty signed in 1824. Since the second world war the once large stake of British investment there has dwindled, but Britain is still one of Argentina's principal suppliers, and certainly its best customer.

I.C.I.'s interests are vested in its subsidiary company Industrias Químicas Argentinas 'Duperial,' which with its associated companies represents an investment of approximately £1·5 million with an annual turnover of £6·5 million and more than 2500 staff and payroll workers. More than half its sales are of locally manufactured products, such as sulphuric, hydrochloric and nitric acids, caustic soda, chlorine and its derivatives, anhydrous ammonia, carbon bisulphide, aluminium sulphate, hydrogen peroxide, synthetic resin and nitrocellulose paints, tartaric acid and sporting ammunition. To this list will shortly be added polyvinyl chloride, which, when the plant at present under construction goes into operation, will turn out initially some 3000 tons of polymer.



Questions set by Michael Danckwerts

I. WHO

(*a*) Who is Lord of the Isles?
(*b*) Who won the 1958 Nobel Peace Prize?
(*c*) Who first ran a four-minute mile?
(*d*) Who said—
  (i) "Speak softly and carry a big stick"?
  (ii) "Every bullet has its billet"?
  (iii) "The ballot is stronger than the bullet"?
(*e*) Who was—
  (i) The Sick Man of Europe?
  (ii) The Sea-Green Incorruptible?
  (iii) Beast No. 666?
  (iv) Public Enemy No. 1?
  (v) The Scourge of God?
  (vi) The Sage of Chelsea?

II. WHAT

(*a*) What show holds the record for the longest British theatrical run?
(*b*) What are Divis, Penmon and Meldrum?
(*c*) What is the weight of a cubic foot of natural uranium metal?
(*d*) What is the main difference between—
  (i) A Large White and a Sulphur Yellow?
  (ii) A Collins and a Tom Collins?
  (iii) Canis Minor and Hinton Admiral?
  (iv) Atle and Timothy?

III. WHEN

(*a*) When in Britain could you last buy a glass of beer, ten cigarettes and a box of matches, and have change out of a shilling?
(*b*) When is 29 the maximum and 19 the impossible?
(*c*) When was the world's land speed record set up?
(*d*) When was the calendar, as we know it, *originally* instituted?
(*e*) When goods are thrown into the sea to lighten a ship, are they known as flotsam or jetsam?

IV. WHICH

(*a*) Which cities are known as—
  (i) The Paris of the North?
  (ii) The Queen of the Adriatic?
  (iii) Auld Reekie?
  (iv) The City of Light?
  (v) The Windy City?
(*b*) Which opera was written to commemorate the opening of the Suez Canal?
(*c*) Which is the nearest European country to the U.S.A.?
(*d*) Which is the odd one out: dog, wireless set, cat, car, gun?
(*e*) Which is the greater—
  (i) A British billion or a U.S.A. billion?
  (ii) A gill or a noggin?
  (iii) A Scottish pint or a Glasgow pint?
(*f*) Which is Britain's oldest colony?

V. WHERE

(*a*) Where would you find a Yarborough?
(*b*) Where do the America's Cup races take place?
(*c*) Where does an Albatross beat an Eagle?
(*d*) Where in Britain does the State—
  (i) Run the public houses?
  (ii) Not run the telephone service?
(*e*) Where was the world's water speed record set up?

VI. HOW

(*a*) How many European countries are still ruled by monarchs?
(*b*) How can you accurately measure 4 gallons of water, given a 5-gallon jar, a 3-gallon jar and a river?
(*c*) How did Sisera die?
(*d*) How long is a mile in—
  (i) Scotland?
  (ii) Ireland?
  (iii) Sweden?
(*e*) How many man-made earth satellites are now in orbit?

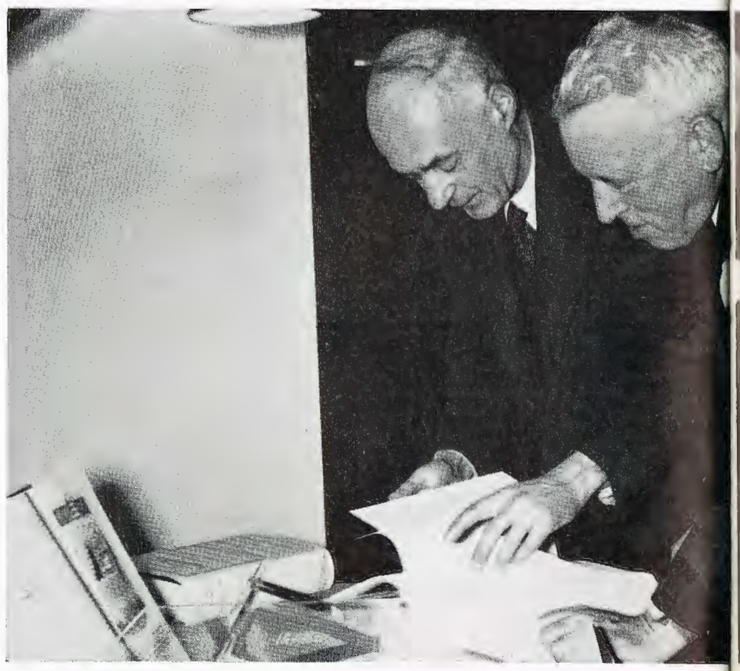
Answers on page 407.

NEWS IN PICTURES

Umbrella boys. *This delightful picture comes from A.E. & C.I. Ltd. Whatever the weather, the Kynoch-Capex umbrella makes a great impression, not only among piccanins but among their parents. Scores of dozens of these umbrellas have been distributed in the reserves to serve as a useful reminder that fertiliser is required for good crops wherever they are grown*

Explosives in India. *The new explosives factory of Indian Explosives Ltd., jointly owned by the Government of India and I.C.I. (India) Private Ltd., was opened at Gomia in Bihar Province on 5th November by the President of India, Dr. Rajendra Prasad. Our picture (above) shows a general view of the production area where raw materials for explosives are made. Right:* **Dr. Rajendra Prasad** *addressed the gathering at the opening ceremony, which was attended by representatives of the Government of India. From I.C.I. Dr. James Taylor and Mr. R. C. Todhunter were among those present. On the President's right is Dr. Zakir Hussain, Governor of Bihar, and extreme right is Mr. J. M. Lall, chairman of I.C.I. (India).* (*See story, page* 402.)

Wire for China. *The largest single consignment of finished copper wire ever to be despatched from the Elliott Works of Metals Division—625 tons of it—destined for China. This is part of one of the first orders to be received by the Division since the embargo on trade with Iron Curtain countries was lifted*



Technology triumph. *On 12th November a reception was held at I.C. House to celebrate the publication of the fifth and final volume of "A History of Technology." The "History" has taken eight years to complete. Our picture shows the President of the Royal Society, Sir Cyril Hinshelwood, representing the Clarendon Press, and Sir Alexander Fleck looking at a copy of the new volume.* (*See story on page* 405.)

International Motor Show. *Each year six members of the Production Department at Leathercloth Division's Hyde Works are chosen to visit the Motor Show to see the I.C.I. products on view there. On the stand with Mr. J. H. McGill, Works Manager (second from right), are Mr. J. Burns, Mr. S. Evans, Mr. W. Bowker, Mr. H. Ashurst, Mr. N. Chambers and Mr. A. Fox, examining the latest car seat covering made from 'Vynide' PVC coated fabric*

Try-out for 'Terylene.' *Mr. Christopher Soames, War Minister, chats with service personnel who modelled the new styles of army uniforms which are now being tried out. The Coldstream Guardsman (second from left) is wearing walking-out dress made in 'Terylene/wool worsted fabric*

Mr. W. H. Moult *has recently retired from Elliott Works, Metals Division, after completing 50 years spent in the Copper Wire Mill. He was senior chargehand in the mill, and worked on the night shift for 27 years*

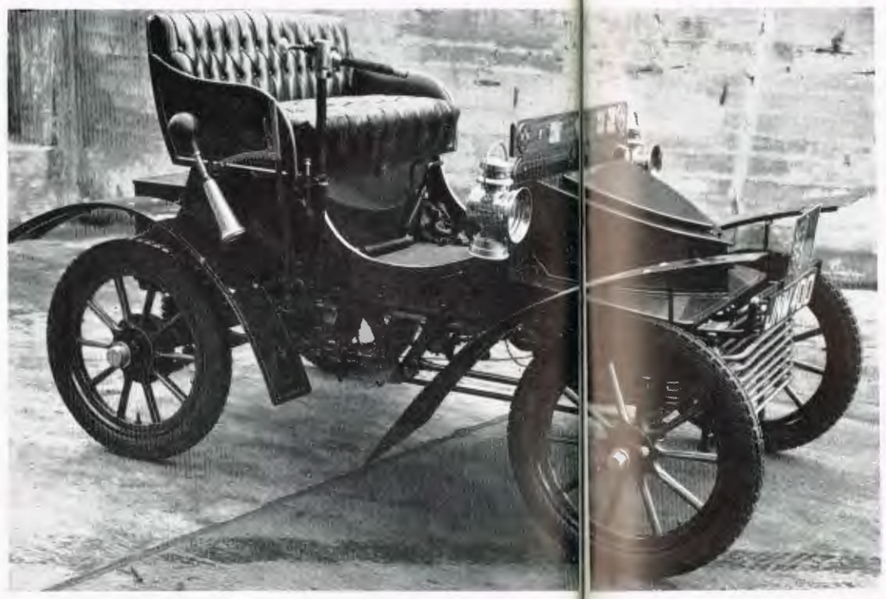
Mr. D. L. Crouch, *Publicity Manager of Fibres Division, has been adopted as prospective Conservative parliamentary candidate for West Leeds. He has been responsible for publicity for 'Terylene' since it was first introduced to the market*

Mr. W. Cashmore, *a chargehand at Elliott Works, Metals Division, completed 50 years' service recently and has just retired. His son, who received his 20 years' long service award this year, is carrying on the family tradition of service at Elliott's*

Mr. Alan Hopwood, *a 'Terylene' Works Bobbin Boy at Fibres Division, was chosen by the Wilton Recreation Club as the most promising footballer of 1958. He has recently spent a week at Scarborough as the guest of the National Council for Physical Education, where he received football coaching*

Single-handed. *Mr. H. Golombek, three times British Chess Ch ampion and chess correspondent to the "Sunday Observer," was invited recently by Wilton Works Chess Section to give an exhibition of simultaneous chess playing against twenty-four players from Wilton, Billingham and Tees-side Clubs. The most formidable opposition ca me from two schoolboys, to both of whom Golombek conceded a draw. He won the remain ing twenty-two games*

Mr. Carton *greeted Metals Division Works Councillors when they assembled for their autumn meeting. The figure is made up entirely of cartons made and printed at Witton by The Kynoch Press and illustrates the wide diversity of sizes and types produced*



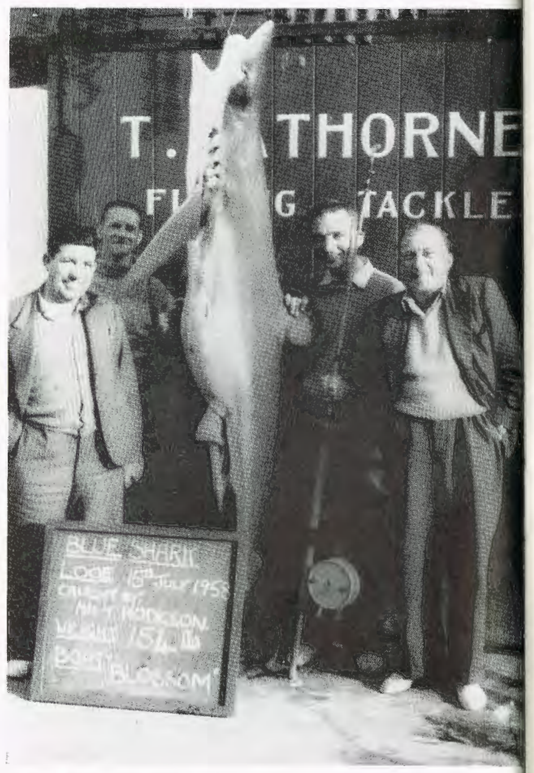
"Vauxhall" veteran. *This 1904 "Genevieve," which took part in the London to Brighton Veterans' Motor Rally last month, looked trim under a new coat of 'Dulux' coach finish. Owned by Vauxhall Motors Ltd., it is affectionately maintained by them at th eir works at Luton*

The Officers of the Central Committee *of I.C.I. Foremen's Associations set up in 1944 photographed before their annual meeting held at I.C. House in October. L. to r.: Messrs. T. W. Littlefair, Billingham (deputy chairman), J. Young, Nobel (chairman), A. H. Hodgkins, General Chemicals (secretary), J. McGleave, Nobel (treasurer), F. Cottrell, General Chemicals (treasurer)*

'Alkathene' design competition. *For the first time Plastics Division are offering this year the 'Alkathene' design trophy to moulders using our 'Alkathene' brand of polythene for retail articles which have not been marketed before 1st January* 1958

Long service award. *On 22nd October at I.C. House Sir Alexander Fleck presented Mr. J. B. Wood, chairman of I.C.I. (Malaya) Ltd. with a gold fob watch after 27 years' service in Malaya*

Buxton Trophy competition. *In London recently Alkali Division's first aid team gained second place for the Buxton Trophy—awarded for the highest aggregate score—and won the Diagnosis Trophy in the competition organised by the Casualties Union. The team, Messrs. G. H. Gandy (captain), J. Warburton, J. Hornbuckle, G. W. Forster, S. Cornwell and W. R. Hall (not in picture) received their award at Haydock Park, Lancs.*



World record? *While on holiday this year, Mr. L. Swales of Billingham Division (second from left) with three friends, helped to land an 8 ft. 3 in. blue shark weighing 154 lb. The Shark Angling Club of Great Britain has sent it forward for recognition as a world record*

Party Line

By Fred Brooke

Illustrated by Peter Dunbar

WELL, it's "so many" shopping days to Christmas. And when it arrives there'll be food, drink, decorations, various jollities, and, of course, a Christmas party. Committees will be meeting. Canteens will change overnight to a kind of special fairyland. Lights, balloons, holly and mistletoe, apples and oranges, nuts—all will be in abundance, because once more it is Christmas. And for the host there will be only one slogan: "Keep the party going."

There are many ways in which he can do this, and here are some of them.

Game No. 1, the "Post Office" game. Simple to organise, easy to run. Will keep a party of any number from twenty to two hundred happy and busy for half an hour or so. The only equipment needed is one small Post Office type money box (cost about ninepence) for every twenty or so players. It's a fairly quiet game. Apart from standing, it makes no other physical demand. Can be played by old and young.

Everybody must have one penny. Children may be given pennies if desired. Assemble players in a circle, with the following simple instructions. "When the music starts, the money boxes must be passed quickly from player to player until the music stops. Whoever then has the money box in his or her hand will place a penny in the slot and sit down, thus being eliminated." This continues rapidly until the number of players left is equal to the number of money boxes in use. The host then blithely announces that the winners are those left holding the money boxes, thus completely reversing the tenor of the game. The prizes, if you like, can be the money boxes containing the pennies contributed by the losing players.

The game is cheap, very funny, fast without being strenuous, and can be put on at any sort of party. And it can be varied. You can allow players two or even three pennies, thus allowing three "lives." Or you can stop the game when there are, say, eight players left, and for prizes arrange a small competition. Once, with a large party, using eight money boxes, I issued the last eight players with knives and instructed them to get the pennies out through the slot—not an easy task, by any means! And I gave a nice box of chocolates to the winner. But remember, it must be played quickly, the real fun of it being that the players actually provide the prize.

Game No. 2 will keep the fun going and at a dance will give the band a much-needed rest.

You'll need string. Lots and lots of it. All conceivable sorts. Thick, thin, cut to lengths varying from two feet to six inches or even four inches. Play the game in a circle, sitting two partners from each group of three opposite each other, the third partner standing behind one of the chairs. At a given signal he begins to tie the two other partners together, using one piece of string only at a time.

As partners are across the room from one another and the string is in short pieces, it isn't as easy as it sounds. But it is amusing. Especially towards the end, when there is much confusion as to which piece of string belongs to which group of partners. This game, too, may be varied. You can use selected threes. It can be played with a group of any size, and it is particularly appealing to family parties, where it is possible to organise groups in order of mummy, daddy, and offspring. Some children, believe it or not, are pretty good at tying up their parents. They

take a fiendish delight in it. And parents too are most vociferous in their encouragement. But don't forget—lots and lots of string! And do play the game in a circle. The bigger the better.

Now for **Game No. 3**—a special novelty dance when everyone is on the floor. First give all the gentlemen a piece of string and a balloon. When the music starts they are to inflate the balloon, tie up the end, and, placing it between their own forehead and that of their partner, begin to dance. From this point on the rule is—No hands, please. Start with a nice, slow foxtrot, then a dreamy waltz. Hot up the music a little. A quickstep, an old-fashioned waltz. A tango. Change quickly from one tempo to another. The dancers will soon have their balloons in all sorts of awkward places. Balloons will be bursting all over the place. And, of course, the loss of the balloon means for them the end of the dance.

Dancers won't be able to see because their balloons will have slipped, and it won't be long before the number of dancers remaining on the floor will be quite small. At this stage begins the fun for the spectators. Vary the dance more. Jig! Reel! Any old tune to keep the fun going. Very quickly there will come the time when there's only one couple left on the floor. Of course you give them a prize. They will surely have earned one!

Then, by way of a change and to offer a rest perhaps to some members of the party, try **Game No. 4.**

It can be played with teams of eight or ten, preferably half of them men, half ladies. Two, three, or even four teams can take part, thus bringing in up to forty or so players. The only equipment needed is some raisins, toothpicks or cocktail sticks, paper bags, and a saucer for each team.

Seat the teams, gents at one end of the room, ladies at the other, and opposite each other, having in the centre of the room a card table for each team on which is placed a saucer of raisins. Space teams a little apart and give each player a toothpick and a paper bag. They are to sit on the paper bag. Little instruction is needed, because at the word "go" the first lady member of each team will run to her team's table, impale a raisin on her toothpick, and one at a time, starting with the ladies, she will feed one raisin to each and every member of her team in turn. When she has fed the last member she stands on her chair and bursts her paper bag to indicate that she has finished and to give the signal for number two to carry on. This performance is continued until every member of the team has had a go, and the team to finish first is the winning one.

This game is adaptable to any group and is the cause of much mirth and merriment. Incidentally, the use of paper bags in this manner in team or relay games is a very good idea. It eliminates advantages and ensures a proper signal being given for the next player to continue. The local grocer will, if asked, give sufficient bags for the game.

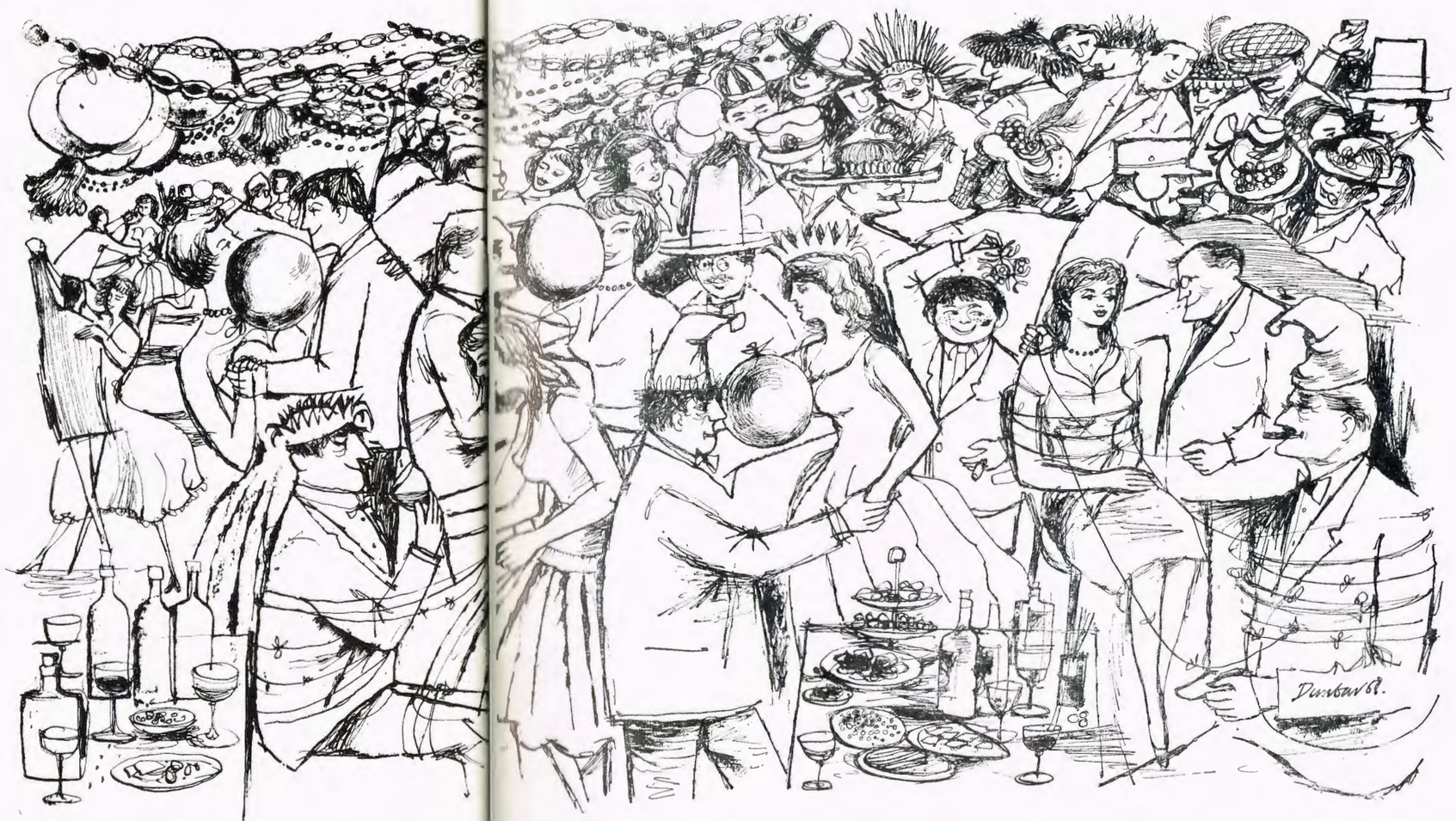
Then there's an awfully funny **Game No. 5,** with hats. It goes down well at any party, although you'll probably never manage to play the game to a finish.

Get together a motley collection of old hats. Ladies' and gents'. Sailors' or soldiers'. The older and funnier the better. All you need then is a group of men in party spirit—not difficult at Christmas! Give out the hats to the volunteers. This will cause shrieks of laughter. It has to be seen to be believed, this business of men trying on ladies' old hats. When things calm down a little, see that every man *but one* has a hat and start the music.

If you can persuade the men to walk round in a sort of chain circle (and it will need several attempts), all you ask them to do is to remove the hat from the head of the gent in front and place it on their own head *after* their hat has been removed by the gent behind. When the music stops, he who is hatless is out of the game.

Each time a player is removed the game begins afresh, less one hat. This game is really and truly chaotic, but without doubt it is a great fun-raiser. And that's the purpose of your party—to have fun for everyone.

There are, of course, lots of other games. But, I'd suggest, be a little inventive. Look at the old ones and try them in a new way. The slogan of the host is "Keep the party going." And whether you're new to it or not, if you're adventurous, if you will use your imagination, and above all if you prepare and plan carefully and in good time, your party, whether it's at home, in the works canteen or at the local palais, will be a huge success.



For the host there is only one slogan: "Keep the party going"

The late Dr. Cyril Garbett, Archbishop of York, at Rievaulx Abbey, Yorks

Photo by A. W. Caunt (Billingham Division)